NATIONAL RADIO ASTRONOMY OBSERVATORY

520 EDGEMONT ROAD CHARLOTTESVILLE, VA 22903-2475

TELEPHONE 434-296-0211 FAX 434-296-0278

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Ohmart/VEGA Corp., REQUEST for WAIVER	)	
of Section 15.205(a) of the Commission's Rules	)	ET Docket No. 07-96
To permit certification and immediate marketing	)	DA 07-2518
of a Tank Level Penetrating Radar (TLPR)	)	
Operating in the band 77 – 81 GHz	)	

Comments of the
National Radio Astronomy Observatory
Charlottesville, VA 22903

I. Introduction; Interference Concerns

1. The National Radio Astronomy Observatory (NRAO) is pleased to provide comments responding to the OET's request for comments DA 07-2518 concerning a request by Ohmart/VEGA Corp for waiver of Section 15.205(a) of the Commission's rules to permit certification and immediate marketing of a tank level penetrating radar (TLPR) operating in the band 77-81 GHz ("the waiver request'). Although we foresee little prospect of detrimental interference to radio astronomy from TPLR operating in industrial/commercial zones under Part 15 rules, NRAO asks that the Commission require the exclusion of TPLR from the immediate vicinity of radio observatories (a few km; see 4 here). We also take strong exception to claims in the waiver request regarding the conditions under which radio astronomy currently operates (see 9 below).

2. NRAO (http://www.nrao.edu), operated by Associated Universities, Inc., (http://www.aui.edu) under a cooperative agreement with the National Science Foundation, is the largest radio astronomy observatory and one of the largest astronomical observatories of any kind in the world. It operates stations within the National Radio Quiet Zone and in one dozen rural locations within the United States, all of which operate at mm-wavelengths and stand to be affected by changes in the Commission's rules governing the operation of unlicensed devices at 80 GHz. NRAO

pioneered in astronomical use of the mm-wave spectrum 40 years ago and has a large stake in continued successful astronomical operations in these bands.

3. Despite the text of footnotes 5.149 and US342, the mm-wave bands above 76 GHz are *usually* although not exclusively used for spectral line studies (the waiver request inadvertently substituted "special line" on p. 16), implying that lower thresholds for detrimental interference obtain in ITU-R Recommendation RA. 769. NRAO will petition the Commission to correct this situation in regard to US342, which has its roots in considerations leading to the final adoption of the text of 5.149.

4. Devices satisfying the Part 15.209 limits -41.3 dBm/MHz for unwanted emissions should operate more than 2.0 km from radio astronomy stations doing singledish spectral line work in order to respect the values cited in Table 2 of ITU-R Recommendation RA.769. This is not a very stringent limitation considering the remoteness of many astronomy stations, even when the spectral line case is considered.

5. Thresholds for detrimental interference to radio astronomy are calculated on a non-directional basis for 0 dBi gain, as noted in ITU-R RA. 769. As a caveat to the small separation distances (2 km) implied by application of RA.769, note that the far field regime of a typical radio astronomy antenna of diameter D=10 m operating at 80 GHz begins at much larger separations, $2D^2/\lambda = 53$ km. Furthermore, the sources of emissions escaping from TPLR might well be extended rather than point-like.. In such a case, the nominal Part 15.209 field limits on unwanted emissions at 3m separation might misrepresent the potential for interference in the far field.

6. NRAO asks the Commission whether the bandwidths proposed for TPLR, 1-10 GHz at 80 GHz (ET Docket 06-216 *ex-parte* comments from the TPLR industry, 25 April 2007) do not require consideration of mm-wave TPLR as UWB devices.

II. Suggested Relief

7. Small nominal separation distances notwithstanding, NRAO requests that the vendors and/or operators of TPLR be required to refrain from permanently installing such devices in the vicinity of radio astronomy stations, and also be required to refrain from expanding the use of TPLR to portable operations which could be located within the vicinity of radio telescopes. Astronomical observatories are often required to support local infrastructure which may include storage tanks for water, gasoline, oil and the like, and they are accessible by road. NRAO wishes to prevent the inadvertent proximity of TPLR to radio telescopes for whatever reason.

8. On page 15 of the waiver request, the petitioner offers to maintain a database of relevant TPLR installations. NRAO endorses this proposal and requests a) that the database locate such installations by both postal code and geographic coordinates; b) that the database contain contact information for the tank and/or TPLR operator, as well as the date of initial operation of the TPLR.

III. NRAO Takes Exception to Statements in the Waiver Request

9. On p. 18, the waiver request improperly implies that radio astronomy is already operating in the presence of 280 times higher unwanted emissions from 76 GHz vehicular radar than would apply to the proposed 77-81 GHz TPLR. As should be well known to Ohmart/VEGA, no substantial rollout of such vehicular radar has yet occurred in the United States. Moreover, NRAO is at loss to understand why Commission rules in other, unrelated, proceedings would have any bearing or provide any relief to Ohmart/VEGA vis-à-vis the waiver request.

Respectfully submitted,

National Radio Astronomy Observatory
By:

Fred K. Y. Lo
Distinguished Scientist and Director

Harvey S. Liszt
Scientist and Spectrum Manager

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Direct correspondence to:
Director
National Radio Astronomy Observatory
520 Edgemont Road
Charlottesville, VA 22903